

Re-Initiation of ESA Section 7 Consultation Number 1999/00836

**Re-Initiation of National Marine Fisheries Service Endangered Species Act (ESA)
Section 7 Consultation Biological Opinion and Magnuson-Stevens Act
Essential Fish Habitat Consultation**

Action Agencies: NOAA's National Marine Fisheries Service (NMFS)

Species/Evolutionarily Significant

Units (ESUs) Affected: Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*)
UCR spring chinook salmon (*O. tshawytscha*)

Essential Fish Habitat

Affected: Chinook and Coho (*O. kisutch*) Salmon

Activities Considered: Issuance of amended permit 1196 jointly to the -
Washington Department of Fish and Wildlife (WDFW), Public
Utility District No. 1 of Chelan County (Chelan PUD), and
Public Utility District No. 1 of Douglas County (Douglas PUD)

Consultation Conducted by: Salmon Recovery Division, Northwest Region
Consultation Number 1999/00836

This Biological Opinion constitutes NMFS' re-initiation of consultation under section 7 on NMFS' intention to amend ESA section 10(a)(1)(A) permit 1196 authorizing take of ESA-listed UCR spring chinook salmon and UCR steelhead by artificial propagation research and enhancement programs rearing listed spring chinook salmon. The programs are operated by the WDFW and funded by Chelan PUD and Douglas PUD. It has been prepared in accordance with section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.). It is based on information provided by the WDFW, the Chelan PUD, the Douglas PUD, published and unpublished scientific information on the biology and ecology of endangered steelhead and spring chinook salmon in the action area, and other sources of information. A complete administrative record of this consultation is on file with the Salmon Recovery Division in Portland, Oregon.

Approved by: Robert B. Walton Jr.
D. Robert Lohn, Regional Administrator

Date: 1/20/04
(Expires ten years from signing)

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1 INTRODUCTION

NOAA's National Marine Fisheries Service (NMFS) is re-initiating consultation with itself on its intention to amend Endangered Species Act (ESA) section 10(a)(1)(A) permit 1196 for research and enhancement programs in the Upper Columbia River (UCR) spring chinook salmon Evolutionarily Significant Unit (ESU). This consultation will consider the impacts of issuing an amended permit 1196 on anadromous salmon species listed under the ESA.

1.1 Consultation History

On December 9, 1998, NMFS received an application for a section 10 permit from the Washington Department of Fish and Wildlife (WDFW) requesting authorization for the directed take of UCR spring chinook salmon associated with supplementation recovery programs it operates in the UCR Basin. Permit 1196 was issued to the WDFW on August 16, 2002 (NMFS 2002a, 2002b). The activities addressed in permit 1196 are funded by the Public Utility District No. 1 of Chelan County (Chelan PUD) and the Public Utility District No. 1 of Douglas County (Douglas PUD). At the time of permit 1196 issuance, the PUDs had not requested to be joint permit holders with the WDFW.

In April 2002, negotiations on three Habitat Conservation Plans (HCPs) were concluded pursuant to section 10(a)(1)(B) of the ESA; *Anadromous Fish Agreement and Habitat Conservation Plan Wells Hydroelectric Project FERC¹ License No. 2149* with Douglas PUD for the operation of Wells Dam (DPUD 2002), and *Anadromous Fish Agreement and Habitat Conservation Plan Rocky Reach Hydroelectric Project FERC License No. 2145* (CPUD 2002a) with Chelan PUD for the operation of Rocky Reach Dam, and *Anadromous Fish Agreement and Habitat Conservation Plan Rock Island Hydroelectric Project FERC License No. 943* with Chelan PUD for the operation of Rock Island Dam (CPUD 2002b). These HCPs² are long-term agreements that at the time of this Biological Opinion (Opinion) have as signatories to each agreement NMFS, the PUDs, the WDFW, the U.S. Fish and Wildlife Service (USFWS), and the Confederated Tribe of the Colville Reservation (Colville Tribes). They provide the PUDs with some degree of certainty for the long-term operation of these projects and require the PUDs to provide mitigation in the form of a tributary fund for habitat improvement projects, and artificial propagation programs to mitigate for unavoidable loss of natural fish production due to habitat inundation and passage mortality at the projects. Furthermore, the three HCP agreements indicate that Chelan PUD and Douglas PUD will be issued the necessary ESA permits to carry out their mitigation obligations.

Biological Opinions with incidental take statements (ITSs) on the operation of each of the above hydroprojects have been issued consistent with the HCPs (NMFS 2003a, 2003b, 2003c).

¹ *Federal Energy Regulatory Commission*

² *Each HCP agreement is subject to a separate Biological Opinion. This Opinion addresses the artificial propagation of UCR spring chinook salmon required in each HCP. Separate Biological Opinions also address artificial propagation programs of other anadromous fish species.*

The HCPs were developed to protect five species of anadromous salmonids; endangered UCR steelhead, unlisted sockeye salmon, unlisted summer/fall chinook salmon, endangered UCR spring chinook salmon, and unlisted coho salmon. Similar permits for artificial propagation programs of other species were issued. Artificial propagation programs that rear and release endangered UCR steelhead are authorized under permit 1395 (NMFS 2003d). Programs that rear and release unlisted sockeye salmon and summer/fall chinook salmon are authorized under permit 1347 (NMFS 2003e). Both of these permits are jointly issued to the WDFW, the Chelan PUD, and the Douglas PUD as part of the larger HCP agreements described above. The proposed amendment to permit 1196 would provide consistency among the permits in language, format, and duration. This permit amendment is necessary for NMFS to meet one obligation of the HCP agreements.

NMFS has evaluated the PUD mitigation actions of funding and implementing artificial propagation programs addressed in the amended permit 1196 under the National Environmental Policy Act (NEPA) as its preferred alternative in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (FEIS) (NMFS 2002c).

Furthermore, an Environmental Assessment (EA) was prepared that assessed the potential impacts of the original issuance of permit 1196 on the environment. A finding of no significant impact (FONSI) was signed on August 9, 2002, following consideration and incorporation of public comments received on the EA (NMFS 2002d). The proposed actions considered in this re-initiated consultation that could affect the environment have not changed since the EA on permit 1196 and the EIS (NMFS 2002c) were prepared. Therefore, NMFS determined that no additional NEPA evaluation was required in preparing this Opinion (NMFS 2003f).

1.2 Analysis Framework

Over the course of the last decade and hundreds of ESA section 7 consultations, NMFS developed the following approach for applying the ESA section 7(a)(2) standards as defined by 50 CFR §402.02 when determining what effect a proposed action is likely to have on a given listed species. This analysis format was followed in the Biological Opinion on the issuance of permit 1196 to the WDFW (NMFS 2002b) and will be carried through in this Opinion:

1. Describe the proposed action (section 2).
2. Define the biological requirements and current status of each listed species and the relevance of the environmental baseline to the species' current status in the action area (section 3).
3. Determine the effects of the proposed or continuing action on listed species and their habitat and evaluate any cumulative effects within the action area (section 4).

4. Evaluate whether the effects of the proposed action, taken together with any cumulative effects and added to the environmental baseline, can be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of the affected species or is likely to destroy or adversely affect their designated critical habitat (section 5).

The status of the species and the environmental baseline have not changed substantially from the conditions previously described in the Biological Opinion on the issuance of permit 1196, and the recently completed Biological Opinions associated with the issuance of permit 1395 and 1347 (NMFS 2003c, 2003d). The actions currently authorized by permit 1196 are included in the environmental baseline for consideration of this amendment. The present document provides information updating the baseline since issuance of permit 1196. This Opinion provides the most recent redd count and adult return data for the UCR spring chinook salmon ESU and relies on information previously provided in the Biological Opinions on the original issuance of permit 1196, and more recently issued permits 1395 and 1347.

2 PROPOSED ACTION

The proposed action is NMFS' issuance of an amended permit 1196 as a jointly held permit to the WDFW, Chelan PUD, and Douglas PUD for a duration of ten years. The objective of this Opinion is to determine the effects of NMFS' issuance of the amended section 10(a)(1)(A) permit 1196 with conditions. The permit would be issued for direct take of listed UCR spring chinook salmon for the spring chinook salmon supplementation programs and associated monitoring and evaluation activities. This is not different from the original permit. The previously authorized WDFW artificial propagation program operational activities would continue. The amended permit would; (1) add Chelan and Douglas PUDs as joint permit holders, (2) extend the duration of the permit from five to ten years, and (3) add monitoring and evaluation tasks to the activities authorized under permit 1196 as described below.

2.1 Chelan PUD and Douglas PUD Activities

The Chelan PUD and the Douglas PUD propose to provide the funding of and implementation support for UCR spring chinook salmon artificial propagation programs as described in the HCPs (CPUD 2002a, 2002b; DPUD 2002). The PUDs propose to implement the specific elements of the spring chinook salmon programs consistent with overall objectives of rebuilding natural populations and compensating for unavoidable inundation and project mortality that result from the operation of Rock Island, Rocky Reach, and Wells Dams. Implementation includes fully funding the hatchery facilities, operations, and evaluations of the artificial propagation programs. Program objectives will be developed by the Joint Fisheries Parties³

³ For the purposes of this Opinion, the Joint Fisheries Parties are the co-manager agencies who have signed the three HCP agreements. At the time of this Opinion, they include NMFS, the WDFW, the USFWS, and the Colville Tribes.

(JFP) and will include contributing to the rebuilding and recovery of naturally reproducing populations of UCR spring chinook salmon in their native habitats, while maintaining genetic and ecologic integrity, and supporting harvest. The HCPs require Hatchery Committees⁴ that may adjust the operation or implementation strategy of the programs based on new scientific data, changes in NMFS hatchery policy, or recommendations of the HCP Hatchery Committees (CPUD 2002a, 2002b; DPUD 002).

The PUDs or their designated agents propose to operate the hatchery facilities according to the terms of Section 8, "Hatchery Compensation Plan," of the HCPs, the ESA section 7 and 10 permit(s), and in consultation with the HCP Hatchery Committees. Currently, the WDFW operates the hatchery facilities for the PUDs. The production level of spring chinook salmon smolts supported by the two PUDs in the UCR Basin is expected to remain consistent with levels provided in Table 1. These levels are the result of habitat loss due to inundation, calculated seven percent passage loss, production traded between species, and production trade agreements between the two PUDs. The HCPs and production agreements provide further information regarding the calculation of production levels. Adjustment to the production levels in Table 1 could occur following survival studies and consensus of the HCP Coordinating Committee in accordance with the HCP agreements. As noted in footnote three of Table 1, the production level of spring chinook salmon in the Methow River Basin may decrease after the 2003 brood because of the termination of a species trade; if adequate funding is obtained from another source, this production may be re-instated.

Table 1. Production levels of spring chinook salmon anticipated by tributary basin and funding entity.

Tributary Basin	Funding Entity	Production level	Release Location ¹
Wenatchee Basin	Chelan PUD	672,000	Chiwawa River
Methow Basin	Chelan PUD	288,000	≈183,000 fish per Methow, Twisp, and Chewuch River ²
	Douglas PUD	61,000	
	Douglas PUD ³	225,000	

¹ Release location could be modified by the HCP Hatchery Committees based on the results of monitoring and evaluation or research findings.

² Methow Basin production is distributed among the Methow, Chewuch, and Twisp Rivers and may fluctuate to some degree annually based on natural origin returns and ability to secure broodstock from each tributary river.

³ Production trade of spring chinook salmon in place of sockeye salmon until the 2003 brood, which will be released in 2005.

The PUDs propose to utilize agreements with other entities to implement hatchery obligations for the rearing, release, monitoring and evaluation, and research. The HCP Hatchery Committees must approve any proposed agreements or trades of production. However, it is the PUDs' responsibility to ensure that their obligations under section 8 of the HCPs (Hatchery Compensation Plan) are satisfied.

⁴ Each HCP agreement specifies the formation of a Hatchery Committee that consists of one representative of each signatory entity to the specific HCP. In general, the HCP Hatchery Committee representation is likely to be similar for all three HCPs.

The HCP Hatchery Committees will develop five-year monitoring and evaluation plans for the hatchery programs and update them every five years. The PUDs will fund the implementation of the monitoring and evaluation plans. The first monitoring and evaluation plan shall be developed by the HCP Hatchery Committees within one year of the issuance of the FERC order incorporating the HCPs into the PUDs' licenses. The monitoring plans will include data collection and analysis of all life stages of spring chinook salmon within the hatchery environment as well as data collection activities outside the hatchery facilities such as spawning ground surveys, juvenile fish traps, and adult traps and monitoring sites.

In the HCP agreements, the PUDs acknowledge that over the duration of the HCPs, new information and technologies that are developed will be considered and utilized in the monitoring and evaluation of the hatchery programs, where appropriate. The PUDs shall implement monitoring and evaluation of the hatchery programs consistent with the HCPs, the general objectives and guidelines listed for each species in the *Biological Assessment and Management Plan* (BAMP) (1998), as determined by the HCP Hatchery Committees, and as described in this Opinion. Monitoring and evaluation or research activities not considered here may require re-initiation of consultation depending on the potential effects of the activities.

2.2 Extend Duration of Permit

NMFS proposed to extend the duration of permit 1196 from five years to ten years. The three HCP agreements were developed to be in effect for 50 years from the time of incorporation into the FERC licenses for each hydropower facility. The artificial propagation programs are intended to mitigate for inundation and unavoidable dam passage losses during the operation of the hydropower facilities. These agreements are intended to provide some level of certainty for the PUDs and other stakeholders. To that end, the HCP agreements stipulate that the artificial propagation production level will remain constant for 10 years with defined program review schedules at five years into the agreement and at the expiration of this permit.

2.3 Monitoring and Evaluation

The Chelan and Douglas PUDs have proposed to implement a monitoring and evaluation plan for the artificial propagation programs of spring chinook salmon (CPUD 2001, 2002a, 2002b) as required in the three HCP agreements within one year of FERC issuance of the hydroproject licenses as mentioned above in Section 2.1 (Chelan PUD and Douglas PUD Proposed Activities).

The long-term nature of the HCP agreements, the certainty of continued funding, and the relative certainty of the proposed action, have led NMFS to propose that both the within-hatchery facility and natural environment monitoring and research projects related to these artificial propagation programs be authorized under the amended permit 1196.

Monitoring and evaluation activities that occur in the hatchery environment are already authorized under permit 1196 (NMFW 2002a, 2002b) and are not addressed further in this

Opinion. Monitoring and evaluation activities that occur in the natural environment that would be added to the amended permit 1196 include: (1) assessment of juvenile salmonid population production in UCR tributary basins using juvenile fish traps; (2) trapping of adult spring chinook salmon at fish ladders at Priest Rapids Wells, Dryden and Tumwater Dams; and (3) spawning ground surveys in the UCR tributary basins to collect biological data and tissue samples from artificially propagated and naturally produced listed spring chinook salmon (DPUD2002; WDFW 2003).

The natural environment monitoring activities are conducted using a variety of standard techniques such as trapping, snorkeling, and surveys (Table 2). Most of these activities were previously authorized under permits 1203 and 1115. Authorization for the activities that target evaluation of the UCR spring chinook salmon artificial propagation programs are consolidated in this amended permit 1196 for consistency with the other artificial propagation program permits related to the three HCPs, continuity in activity, and appropriateness based on their relevance to artificial propagation programs. Furthermore, permits 1203 and 1115 expire on December 31, 2003. As part of the comprehensive monitoring and evaluation program, a specific research project is proposed that has not previously been authorized. Take, in the form of capture, handling, non-lethal tissue collection, and release of adult and juvenile spring chinook salmon in the Wenatchee River Basin, would occur concurrent with previously authorized take activities.

Table 2. Monitoring and evaluation tasks which would be added to the amended permit 1196 to be conducted in the natural environment.

<i>Juvenile Spring Chinook Salmon</i>	
◆	Rotary screw traps would be used to monitor emigration rate of released smolts, natural production of hatchery reared adults that spawn in the streams
◆	Biological sampling may include meristic, morphometric, tissue samples (for genetic stock identification or DNA (deoxyribonucleic acid) analysis), and scale sampling
◆	Juveniles may be monitored using standard snorkeling techniques to assess habitat utilization and interactions with naturally produced salmon
<i>Adult Spring Chinook Salmon</i>	
◆	Adult returns to tributary traps would be sampled for stock composition analysis including determination of sex, age, and stray rates
◆	Snorkeling may be used to identify hatchery reared adults on redds to assess mate and site selection in the natural environment
◆	Hatchery origin natural spawners would be monitored using redd counts and carcass surveys
◆	Biological sampling may include meristic, morphometric, tissue samples (for genetic stock identification or DNA (deoxyribonucleic acid) analysis), and scale sampling
◆	Snouts of coded-wire tagged (CWT) carcasses would be collected
◆	Egg voidance of natural spawned females would be determined during carcass surveys

Juvenile Spring Chinook Salmon

Natural environment monitoring of juvenile spring chinook salmon would be conducted using standard techniques such as trapping and snorkeling. In general, these population sampling techniques would be used to identify both external marks and tags, and internal tags to assess migration rate and post release survival. Migration characteristics and tributary productivity would be monitored using juvenile fish traps and could include tagging of naturally produced offspring of hatchery origin spawners.

Juvenile fish traps are proposed to be operated in the Chiwawa River, the upper and lower Wenatchee River, the Twisp River, and the Methow River. These traps would form a comprehensive juvenile monitoring program investigating the productivity of artificially propagated and natural origin UCR spring chinook salmon and any other anadromous fish species present in the river system. For example, the Chiwawa River smolt trap is authorized to target UCR steelhead and incidentally take UCR spring chinook salmon under permit 1395 (NMFS 2003c). The amended permit 1196 would authorize the UCR spring chinook salmon to be targeted in trapping operations and UCR steelhead to be incidentally taken. The upper Wenatchee River trap would operate to monitor UCR spring chinook salmon and sockeye salmon emigrating out of Lake Wenatchee, and the lower Wenatchee River trap would monitor UCR spring chinook salmon, UCR steelhead, Wenatchee summer chinook salmon, and coho salmon from the Yakama Nation coho salmon reintroduction program.

The trapping efficiency would be expected to vary from below four percent up to 30 percent depending on tributary conditions such as discharge and debris load. The capture of artificially propagated UCR spring chinook salmon in the juvenile traps would also vary based on release location in relation to trap site and method of release. For example, UCR spring chinook salmon smolts released volitionally over a period of four to six weeks may be captured at a higher rate overall compared to a direct stream release at a single point in time. In the case of the latter release, the traps would not be operated as the large pulse of artificially propagated UCR spring chinook salmon migrate past the trap site. In the former situation, a relatively small number of released fish could be captured daily throughout the volitional release period.

Adult Spring Chinook Salmon

Monitoring of adults in the natural environment will include collection of biological data, such as scale samples and CWT recoveries, in fisheries, at trap sites, spawning ground surveys, and in carcass surveys. Spawning and carcass surveys are proposed to be conducted by WDFW staff in coordination with PUD, Tribal, USFWS, and U.S. Forest Service personnel. Surveys would be done on foot, from an airplane, or from a boat, depending on survey area.

Included in the HCPs are investigations to address specific questions regarding the impacts of the proposed artificial propagation programs on natural populations and their ability to meet program goals consistent with the three HCPs. One research proposal has been submitted for consideration (Ford 2003). This study is proposed as a cooperative project with Bonneville Power Administration (BPA) funding, implemented by the WDFW and NMFS's Northwest

Fisheries Science Center, and with operational support of Chelan PUD. It is consistent with the requirements of the HCPs and is included in this amended permit.

This project will quantitatively evaluate the relative reproductive success of naturally spawning hatchery and natural origin spring chinook salmon in the Wenatchee River (Ford 2003). The project is intended to last nine years (until 2012) in order to evaluate two entire spring chinook salmon generations. Collection, handling, biological sampling including collection of fin tissue, tagging, and release of adult UCR spring chinook salmon at Tumwater Dam on the Wenatchee River is proposed (Ford 2003). All fish other than spring chinook salmon would be released upstream.

Juvenile spring chinook salmon would be systematically sampled at one or more screw traps located in the Wenatchee River (Ford 2003). Hatchery produced smolts would be sampled at the Chiwawa rearing ponds just prior to release. For all adult and smolt samples, DNA would be extracted using standard methods and genotypes at 6-12 highly variable microsatellite loci would be determined. All samples would be processed at the NMFS Northwest Fisheries Science Center in Seattle, Washington.

Additional monitoring of the number of anadromous hatchery and naturally produced, and non-anadromous hatchery and naturally produced (precocial) adults on redds would occur annually using standard snorkeling techniques, concurrent with routine redd counts and carcass survey efforts.

A variety of methods to estimate the relative fitness of hatchery and naturally produced salmon would be used. All of the methods are based on using DNA typing techniques to estimate how many progeny were produced by sampled adults. Progress reports would be submitted quarterly to summarize project progress.

Quarterly progress reports and a Technical Oversight Committee would provide timely updates on the research project activities. A draft annual report, would be completed by March 31 each year of the study. At the conclusion of the study, a final report would be written and submitted to the funding entities and NMFS.

2.4 Permit Conditions

NMFS proposes to issue an amended permit 1196 jointly to the WDFW, the Chelan PUD, and the Douglas PUD. The following conditions would be added to the existing permit 1196 conditions.

The activities undertaken by each of the joint permit holders varies based on their permit applications, program operational roles, and resource management responsibilities. The WDFW is generally the lead co-manager of the fisheries resources of the state of Washington and is also the operator of the hatchery facilities at which the proposed activities would occur. As the resource managing entity, WDFW would be anticipated to be the lead entity for most of the field

work actions. This includes adult return monitoring, management of returning hatchery-origin spring chinook salmon adults, general hatchery operations associated with the UCR spring chinook salmon enhancement programs, and monitoring and evaluation related to the UCR spring chinook salmon artificial propagation programs. The PUDs propose to provide funding of and implementation support for the programs.

The following terms and conditions would be added to the amended permit 1196 in order to minimize the potential adverse impacts associated with the activities and are therefore part of the proposed action. The amended permit would authorize the annual incidental take of listed UCR steelhead during the same activities.

A. Take Description and Levels

This permit is for activities to be conducted over a period of ten years. Annual take listed below are subject to the annual authorization process (see Section C - Reports and Annual Authorization Requirements) during the period that this permit is valid.

Permit Holders means any of the three permit holders and any employee, contractor, or agent of any of the permit holders.

The Permit Holders must ensure that listed species are taken only at the levels, by the means, in the areas, and for the purposes stated in the permit application, and according to the terms and conditions in this permit.

Intentional Take

1. The Permit Holders may capture, handle, and release up to 20 percent of the natural-origin spring chinook salmon juveniles in a tributary basin using standard juvenile fish trapping techniques such as rotary screw traps. Lethal take may not exceed two percent of the fish captured.
2. The WDFW may capture, non-lethally sample, tag, and release up to 2,000 naturally produced and up to 1,000 artificially propagated juvenile spring chinook salmon for the investigation of reproductive success of naturally spawning hatchery and natural spring chinook salmon in the Wenatchee River Basin.
3. The tissue samples collected by the WDFW for the investigation of reproductive success of naturally spawning hatchery and natural spring chinook salmon in the Wenatchee River may be transferred to NMFS personnel for microsatellite DNA analysis.

Incidental Take

Incidental takes of UCR steelhead associated with hatchery operations, adult broodstock collection, and juvenile fish releases were authorized under the original permit 1196. Additional

incidental take may occur due to the increased natural environmental monitoring and research associated with the amended permit 1196. The existence of concurrent WDFW artificial propagation programs and monitoring projects for listed steelhead authorized under permit 1395, and unlisted salmon authorized under permit 1347, at the same facilities and areas, further complicate the ability to identify incidental takes occurring specifically attributable to the UCR spring chinook salmon programs. For example, juvenile fish traps would be operated to collect biological data on all anadromous species encountered, including UCR steelhead, to assess production and emigration of each species, this monitoring activity targeting UCR steelhead is authorized under section 10(a)(1)(A) permit 1395. If a juvenile fish trap is not operated to concurrently collect data on UCR steelhead, then the following conditions apply:

1. Incidental take in the form of capture handle, and release will not exceed 20 percent of the tributary population.
2. The mortality take should not exceed one percent of the trapped UCR steelhead.

B. Program Management and Operation Conditions

The following conditions address PUD obligations, program management, fish handling, hatchery facility operations, and monitoring and evaluations activities.

1. The Chelan PUD shall provide the necessary capacity to allow artificial propagation compensation of 672,000 yearling UCR spring chinook salmon juveniles for release in the Wenatchee River Basin as described in the HCP agreements (CPUD 2002a, 2002b).
2. The Chelan PUD shall provide the necessary capacity to allow artificial propagation compensation of 288,000 yearling UCR spring chinook salmon juveniles for release into the Methow River Basin as described in the HCP agreements (CPUD 2002a, 2002b).
3. The Douglas PUD shall provide the necessary capacity to allow artificial propagation compensation of 49,200 pounds of UCR spring chinook salmon in the Methow River Basin. Through the duration of this permit, Douglas PUD shall provide artificial propagation compensation of 61,071 yearling UCR spring chinook salmon juveniles for release into the Methow River Basin.
4. Through the 2003 brood year (2005 release year), Douglas PUD shall provide funding of and implementation support for artificial propagation compensation of 225,000 yearling UCR spring chinook salmon juveniles for release into the Methow River Basin in a species trade to replace sockeye salmon compensation as described in the Wells Dam HCP agreement (DPUD 2002).
5. The Chelan PUD and Douglas PUD shall fund the specific elements of the artificial propagation programs objectives developed by the HCP Hatchery Committees consisted with the HCPs, which may include contributing to the rebuilding and recovery of

naturally reproducing populations in their native habitats, while maintaining genetic and ecologic integrity of the natural populations, and supporting harvest.

6. The Chelan PUD and Douglas PUD shall be responsive to new information and technologies that are developed, and approved by the HCP Hatchery Committees, that may be considered and utilized in the monitoring and evaluation of the artificial propagation programs, where appropriate.
7. The Chelan PUD and Douglas PUD shall fund artificial propagation program monitoring and evaluation consistent with the HCPs, the general objectives and guidelines listed for in the BAMP, the section 7 Opinion on the issuance of this permit, and as determined by the HCP Hatchery Committees.
8. The WDFW shall operate and manage the UCR spring chinook salmon artificial propagation programs including the impact minimization measures as proposed in Section II of the section 7 Biological Opinion on the original issuance of permit 1196 and in the permit application (WDFW 1998).
9. Each ESA-listed fish handled out-of-water for the purpose of recording biological information must be anesthetized. Anesthetized fish must be allowed to recover (e.g., in a recovery tank) before being released. Fish that are simply counted must remain in water but do not need to be anesthetized.
10. If water temperature at adult trapping sites exceeds 69.8°F(21°C), the trap operation shall cease pending further consultation with NMFS to determine if continued trap operation poses substantial risk to ESA-listed species.
11. To the extent possible without imposing increased risk to listed species, the Permit Holders shall enumerate and identify marks and tags on all anadromous species encountered at adult and juvenile trapping sites. This information shall be included in either an annual brood program report or a monitoring and evaluation report submitted to NMFS. Specific reporting protocols will be determined by the HCP Hatchery Committees.
12. Measures shall be applied to ensure that artificially propagated UCR spring chinook salmon juveniles that are released as yearlings are ready to actively migrate to the ocean with minimal delay. To meet this condition, fish must be released at a uniform size and state of smoltification. To prevent catastrophic mortality or to reduce the preponderance of chronic disease, variance from the smolts-only release requirement may be pursued after agreement with the HCP Hatchery Committees and NMFS. Conditions such as flooding, water loss to raceways, or vandalism may warrant early release into appropriate environments after review by the HCP Hatchery Committed and NMFS. Any emergency release of UCR spring chinook salmon covered under this permit shall be reported immediately to the NMFS Salmon Recovery Division in Portland, Oregon.

13. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during sampling and processing procedures. Adequate circulation and replenishment of water in holding units is required. When using methods that capture a mix of species, ESA-listed fish must be processed first. The transfer of ESA-listed fish must be conducted using equipment that holds water during transfer (e.g., sanctuary net or boot).
14. The Permit Holders shall ensure that water intakes into artificial propagation facilities be properly screened in compliance with 1995 NMFS screening criteria and as per the 1996 addendum to those criteria (NMFS 1996). As an alternative, they shall comply with transitional criteria set forth by NMFS in 1999 for juvenile fish screens constructed prior to the establishment of the 1995 criteria (NMFS 1996), to minimize risks to listed salmon and steelhead. The Permit Holders shall inspect and monitor the water intake screen structures at their hatchery facilities to determine if listed salmon and steelhead are being drawn into the facility; the results of this monitoring shall be included in annual reports.
15. The Permit Holders shall conduct hatchery operations and monitor hatchery effluent in compliance with applicable National Pollutant Discharge Elimination System (NPDES) (EPA 1999) permit limitations.
16. ESA-listed juvenile fish must not be handled if the water temperature exceeds 69.8°F (21°C) at the capture site. Under these conditions, ESA-listed fish may only be identified and counted.
17. Visual observation protocols must be used instead of intrusive sampling methods whenever possible. This is especially appropriate when merely ascertaining the presence of anadromous fish.
18. The Permit Holders may conduct spawning ground and carcass surveys to assess the distribution and impact of artificially propagated UCR spring chinook salmon on the natural-origin spring chinook salmon populations.

C. Reports and Annual Authorization

NMFS contact for all reports: NMFS - Salmon Recovery Division
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1. The Permit Holders shall develop through the HCP Hatchery Committees the reporting responsibilities of each of the three joint Permit Holders. Final approval of report content, responsibilities, and time lines shall be obtained from NMFS Salmon Recovery

Division in Portland, Oregon. The following issues should be considered for required reporting:

Within Hatchery Environment Monitoring Reporting

- The numbers, pounds, dates, tag/mark information, and locations of fish releases;
- Standard survival benchmarks within the hatchery environment as defined by the HCP Hatchery Committees;
- Monitoring and evaluation activities that occur within the hatchery environment;
- Coefficient of variation around the average (target) release size immediately prior to their liberation from the acclimation sites as an indicator of population size uniformity and smoltification status;
- Any problems that may have arisen during conduct of the authorized activities;
- A statement as to whether or not the activities had any unforeseen effects;
- Steps that have been and will be taken to coordinate the research or monitoring with that of other researchers;

Natural Environment Monitoring Reporting

- Annual adult return information shall include estimates of the number and proportion of artificially propagated fish on the spawning grounds;
- The number and location of artificially propagated adults that were recovered outside the release areas (e.g., in fisheries or strays to other rivers);
- Total and index redd counts by tributary basin;
- Carcass recovery summary which includes sex, origin, tributary location, age, and stock data.
- Broodstock monitoring and collection summary by location, including summary of all species encountered.
- Summary of all activities monitoring juvenile UCR spring chinook salmon in the natural environment including trap locations, tributary or subbasin population estimates;
- Biological sampling conducted on artificially propagated and natural origin juveniles in the natural environment;
- Injuries or mortalities of listed species that result from monitoring activities; and
- Any other information deemed necessary for assessing the program defined by the HCP Hatchery Committees.

2. The Chelan PUD and Douglas PUD, in coordination with the HCP Hatchery Committees, shall develop five-year monitoring and evaluation plans for the hatchery programs that are updated every five years. The first monitoring and evaluation plans shall be completed within one year of the issuance of the FERC order incorporating the HCPs into the hydroproject operation licenses. Existing monitoring and evaluation programs shall continue until replaced by the HCP Hatchery Committees newly developed five-year monitoring and evaluation plans.
3. The Chelan PUD and Douglas PUD shall assume the lead, and work in coordination with the HCP Hatchery Committees, in developing the ten-year hatchery program reviews and

directing the development of annual summary reports. The program reviews will determine if egg-to-fry and smolt-to adult survival rates, and other appropriate hatchery program goals and objectives of the HCPs and the ESA section 10 permits have been met or sufficient progress is being made towards their achievement. This review shall include a determination of whether artificially propagated production objectives are being achieved.

2.5 Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02).

Effects of the activities considered in this re-initiation of consultation would occur within the same action area previously considered initial consultation of the issuance of permit 1196. This includes areas primarily in Chelan, Douglas, and, Okanogan counties; more specifically, the Columbia River at and above Priest Rapids Dam, the Wenatchee River, Methow River, and Okanogan River Basins and artificial propagation facilities along the mainstem Columbia River.

Critical habitat was designated for UCR spring chinook salmon and UCR steelhead in 2000 when NMFS published a final rule in the Federal Register (65 FR 7764). However, the critical habitat designations were vacated and remanded to NMFS for new rulemaking pursuant to a court order in April 2002. The designation of critical habitat for the UCR spring chinook salmon ESU or UCR steelhead ESU will trigger a re-initiation of ESA consultation.

3 STATUS OF SPECIES UNDER THE ENVIRONMENTAL BASELINE

Relying on the Biological Opinion developed on the issuance of permit 1196, little has changed in terms of the status of naturally produced UCR spring chinook salmon and UCR steelhead since it was issued on August 16, 2002 (NMFS 2002a, 2002b). The following information repeats some of the information provided in that Opinion, but includes the most recent run information, updating information provided in that Opinion.

3.1 UCR Spring Chinook Salmon

The UCR spring chinook salmon ESU, listed as endangered on March 24, 1999 (64 FR 14308), includes all natural-origin stream-type chinook salmon from river reaches above Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River Basins (Myers *et al.* 1998). All stocks, with the exception of the Methow stock, were considered by WDF *et al.* (1993) to be of native origin, of natural production type, and as depressed in status. The WDFW considers the Methow spring chinook salmon stock to be a composite in production type, but of native origin, and depressed in status.

When listing the UCR spring chinook salmon as endangered, NMFS included six hatchery populations as part of the ESU: Chewuch River, Methow River, Twisp River, Chiwawa River, White River and Nason Creek. These six hatchery populations were considered to be essential for recovery and were therefore listed as part of the ESU. Hatchery populations at Winthrop NFH, Entiat NFH, and Leavenworth NFH were not included as part of the ESU because they were derived from Carson NFH spring chinook salmon.

NMFS has proposed Interim Recovery Abundance Levels and Cautionary Levels (Ford *et al.* 2001). *Cautionary Levels* were characterized as natural origin abundance levels that the population fell below only about 10 percent of the time during a historical period when it was considered to be relatively healthy (Table 3). The three independent populations of spring chinook salmon identified for the ESU include those that spawn in the Wenatchee, Entiat, and Methow Basins (Ford *et al.* 2001).

Table 3. Natural origin Upper Columbia River spring chinook salmon annual returns by tributary basin.

Year	Wenatchee Basin	Entiat Basin ^a	Methow Basin
1994	308	82	331
1995	50	31	33
1996	201	28	126
1997	422	69	247
1998	218	58	125
1999	119	65	73
2000	489	55	75
2001	1,943	339	281
2002 ^b	1,033	303	353
Recovery Abundance	3,750	500	2,000
Cautionary Abundance	1,200	150	750

^a Update information from Dave Carie, USFWS, May 13, 2002

^b Preliminary data

All three of the existing UCR spring chinook salmon natural reproducing populations have exhibited similar downward trends and patterns in abundance over the past 40 years (NMFS 2002b, 2003b, 2003c). Assuming that population growth rates were to continue at 1980-2000 levels, UCR spring chinook salmon populations are projected to have very high probabilities of 90 percent decline within 50 years (87 to 100 percent).

Redd counts in the three basins have improved in recent years, largely because of natural spawning by artificially propagated spring chinook salmon. In the Methow River, artificially propagated fish have made up over 90 percent of all spawners since 2000.

The reproductive effectiveness of these hatchery origin salmon is not known at this time. However, preliminary indications in the Wenatchee River Basin suggest that the Chiwawa spring chinook salmon program is contributing to natural reproduction in successive generations (Andrew Murdoch, WDFW, pers com.). Successful reproduction over generations has not been demonstrated for the other basins as yet. A summary of recent redd count data and spawner composition is provided in Table 4.

Table 4. Annual total redd counts and proportion of artificially propagated to natural origin spring chinook salmon by tributary basin (Andrew Murdoch, WDFW, pers. comm.)

Basin	Return Year								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
Redd Count									
<i>Wenatchee Basin ^a</i>									
Chiwawa River	82	13	23	82	39	34	128	1046	
Nason Creek	27	7	33	55	29	8	100	367	
White River	3	2	12	15	5	1	8	93	
<i>Entiat Basin</i>	34	13	20	37	24	27	73	202	112
<i>Methow Basin</i>									
Twisp River	32	4	0	32	0	7	99	370	109
Chewuch River	27	2	0	55	0	6	20	1,037	301
Methow River	64	9	0	56	0	17	232	2,828	722
Proportion of Hatchery to Natural Origin Spawners ^b									
<i>Wenatchee Basin ^a</i>									
Chiwawa River	0.40	0.05	0.43	0.70	0.56	0.33	0.56	0.74	
Nason Creek	0.23	0	0.33	0.63	0.19	0	0.24	0.61	
White River	0	0	0	0	0	0	0	0.21	
<i>Entiat Basin ^c</i>	0	0	0.20	??	0	0	0.58	0.25	0.18
<i>Methow Basin</i>									
Twisp River	0	0	0	0.25	0	0.64	0.96	0.33	0.27
Chewuch River	0.29	0	0	0.33	0	0.64	0.42	0.64	0.87
Methow River	0.14	0	0	0.37	0	0.39	0.91	0.95	0.95

^a Areas upstream of Tumwater Dam^b Based on coded-wire tag recoveries^c Minimum values, some carcasses were of unknown origin

While some improvement can be seen in recent years, the ESU is still at critically low levels compared to both historic production and the desired escapement levels—particularly for natural fish. Therefore, while there is some cause for guarded optimism, NMFS finds that there has been no genuine change in the species' status since they were listed as endangered, and the

biological requirements are not being met with respect to abundance, distribution, or overall trend.

3.2 UCR Steelhead

The status of the UCR steelhead ESU was presented in the Biological Opinion on the issuance of permit 1395 (NMFS 2003b) which, as previously mentioned, authorizes the operation of artificial propagation programs in the UCR Basin of listed UCR steelhead and is only summarized below.

The UCR steelhead ESU, listed as endangered on August 18, 1997 (62 FR 43937), includes all natural-origin populations of steelhead in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S./Canada border. The Wells Hatchery steelhead stock is considered essential for recovery, and is included in the listing.

On April 4, 2002, NOAA Fisheries defined interim abundance recovery targets for each spawning population in this ESU (Lohn 2002). These targets are intended to represent the number and productivity of naturally produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. They should not be considered in isolation, as they represent the numbers that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. For UCR steelhead, the interim recovery levels are 2,500 spawners in the Wenatchee River, 500 spawners in the Entiat River, and 2,500 spawners in the Methow River (Lohn 2002). In terms of natural production, recent population abundances for both the Wenatchee/Entiat River aggregate population and the Methow population remain well below the interim recovery levels developed for these populations (BRT 2003).

While some improvement can be seen in recent years, the ESU is still at critically low levels compared to both historic production and the desired escapement levels of natural origin UCR steelhead. Therefore, while there is some cause for very guarded optimism, there has been no genuine change in the species' status since they were listed as endangered, and, based on the best available science, NMFS finds that the biological requirements are not being met with respect to abundance, distribution, or overall trend.

3.3 Factors Affecting the Environmental Baseline in the Action Area

Environmental baselines for biological opinions are defined by regulation at 50 CFR §402.02, which states that an environmental baseline is the physical result of all past and present state, Federal, and private activities in the action area along with the anticipated impacts of all proposed Federal projects in the action area (that have already undergone formal or early section 7 consultation). The environmental baseline for this Opinion is therefore the result of the impacts a great many activities (summarized below) have had on UCR spring chinook salmon and steelhead survival and recovery. Put another way, the baseline is the culmination of the effects that multiple activities have had on the species' biological requirements and, by examining those individual effects, it is possible to derive the species' status in the action area.

The best scientific information presently available demonstrates that a multitude of factors, past and present, have contributed to the decline of west coast salmonids by adversely affecting these essential habitat features. These factors are well known and documented in dozens—if not hundreds—of scientific papers, policy documents, news articles, books, and other media. It is therefore unnecessary to detail in this Opinion the many ways in which human activities and natural factors have affected the UCR spring chinook salmon's and steelhead's habitat-related biological requirements; the following paragraphs constitute a brief summary of what the most recent accepted science has to say about how human action and natural processes have degraded essential steelhead habitat features in the UCR Basin.

Some factors in the action area (e.g., hydropower and agricultural development—particularly irrigation diversions) have had adverse effects on the habitat-related biological requirements of UCR spring chinook salmon and UCR steelhead, while other factors have only affected some of those essential habitat features. For example, road building in UCR tributary basins has had a sizeable effect on stream substrates and water quality (through siltation), and road culverts have blocked fish passage, but such activities have not had much of an effect on water velocity. In another instance, timber harvest and grazing activities have affected—to greater or lesser degrees—all the factors except space. And urban development has affected them all, but generally to a smaller degree in the largely rural UCR Basin. In short, nearly every widespread human activity in the basin has adversely affected some or all of the habitat features, and by disrupting those habitat features, these activities—coupled with past hatchery and fishery effects and occasional natural disturbances such as drought and fire—have had detrimental impacts on UCR steelhead and spring chinook salmon health, physiology, numbers, and distribution in virtually every subpopulation and at every life stage. For detailed information on how various factors have degraded essential habitat features in the UCR Basin, please see the Biological Opinions on the three HCP agreements (NMFS 2003a, 2003b, 2003c).

In conclusion, the picture of whether UCR steelhead and spring chinook salmon biological requirements are being met is more clear-cut for habitat-related parameters than it is for population factors: given all the factors for decline, it is clear that the UCR steelhead and spring chinook salmon biological requirements are currently not being met under the environmental baseline. Thus their status is such that a substantial improvement in the environmental conditions of their habitat is needed (over those currently available under the environmental baseline). Any further degradation of the environmental conditions could have a large impact because the species is already at risk of becoming extinct. In addition, there must be continued efforts to minimize impacts caused by dams, harvest, hatchery operations, habitat degradation, and unfavorable natural conditions.

4 ANALYSIS OF THE EFFECTS

NMFS analyzes the direct and indirect effects on an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline. Indirect effects are those that are caused by the

proposed action and are later in time, but still are reasonably certain to occur. Interrelated action are those that are part of a larger action and depend on the larger action for the justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR §402.02).

The effects analysis in this Opinion considers only the potential effects of the activities to be added in this amended permit 1196. The effects of actions addressed in the Biological Opinion on the issuance of permit 1196 (NMFS 2002b) are not reiterated. The proposed action have the potential to directly effect ESA-listed UCR spring chinook salmon and incidentally effect UCR steelhead. The ESA section 10(a)(1)(A) process includes applicant proposed measures, and terms and conditions proposed by NMFS which function together to be protective of listed species. This section considers the potential effects of the proposed action in the categories of new activities in Section 2 above (Proposed Actions) on the two ESA-listed ESUs that occur in the action area.

4.1 Effects of Proposed Action on UCR Spring Chinook Salmon

The potential effects of the issuance of amended permit 1196 on UCR spring chinook salmon are evaluated in this section.

4.1.1 Chelan PUD and Douglas PUD Activities

The proposed PUD actions include providing consistent and predictable funding of and implementation support for the artificial propagation programs in the Wenatchee and Methow River Basins that began with the 1989 and 1992 brood years, respectively. The certainty of funding, particularly monitoring and evaluation support, is expected to have a positive impact on the recovery efforts from a broad perspective. The effects on UCR spring chinook salmon from the operation of the artificial propagation programs was evaluated in the Biological Opinion that accompanied the initial issuance of permit 1196, which concluded that the supplementation programs are expected to provide a survival benefit through numeric increases in the species.

4.1.2 Extend Duration of Permit

NMFS action of extending the duration of permit 1196 from five years to ten years is not anticipated to adversely impact UCR spring chinook salmon. Because the specific effects have already been evaluated, the only difference as a result of extending the permit would arise from additive or holistic effects. As discussed elsewhere (NMFS 2002a, 2002c), there are aspects of artificial propagation that may increase in level of adverse effects if applied over extended periods of time. However, this is not expected to be an issue here for two reasons. First, an additional five years of operation (roughly one generation) is not likely to be sufficient to allow such accumulated effects to manifest themselves. Second, the three HCPs and the permit conditions clearly provide for ongoing review and adjustment of the artificial propagation programs. This includes annual reporting requirements, the development of a monitoring and evaluation plan within one year of FERC re-licensing, and a comprehensive review five years

after re-licensing of all artificial propagation programs funded by Chelan and Douglas PUD. Additionally, the HCP Hatchery Committees will have an ongoing role to adjust program implementation. NMFS is represented on each HCP Hatchery Committee and must review each annual and periodic report to ensure that the programs are functionally appropriately and consistently with ESA authorizations. Furthermore, if NMFS finds that the implementation of the HCPs results in adverse impacts on listed species not previously considered during the consultation, then NMFS must reinitiate consultation. NMFS finds that these mechanisms are sufficient to protect the UCR spring chinook salmon ESU from adverse impacts artificial propagation programs including accumulated effects, and as previously stated, these programs are expected to provide a net benefit to the species.

4.1.3 Monitoring and Evaluation

Natural environment monitoring and evaluation are a critical component of the three HCP agreements. The adaptive management strategy relies on three hatchery committees (one for each HCP agreement) to provide oversight and recommendations for the artificial propagation programs specified in the HCPs. The natural environment monitoring will involve both adult and juvenile UCR spring chinook salmon components and the likely effects are assessed below.

Juvenile Spring Chinook Salmon

Monitoring of artificially propagated juvenile spring chinook salmon after release will be done using a variety of techniques, depending on the investigative objective. Snorkeling or other visual observation techniques, which may temporarily displace rearing fish, are the least invasive. Such activities are not likely to substantially impact the ESU.

The capture and handling of fish using traps is likely to cause some stress on ESA-listed fish. Typically, fish recovery rapidly from handling procedures. The primary factors that contribute to stress and mortality from handling are excessive doses of anesthetic, differences in water temperature, dissolved oxygen conditions, the amount of time that fish are held out of water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C (64.4°F) or if dissolved oxygen is below saturation. Also, stress can occur if there are more than a few degrees difference in water temperature between the stream/river and the holding tank. The potential for unexpected injuries or mortalities to ESA-listed fish will be mitigated in a number of ways. Keeping handlers' hands wet and keeping fish submerged while measuring would minimize scale and slime removal. Study protocols would include only handling fish during appropriate water temperatures to avoid adding any additional stress and ensuring revival prior to release. The use of sanctuary nets when transferring fish to holding containers would avoid potential injuries. Appropriate anesthetics would be used to calm fish subjected to collection of biological data, captured fish would be allowed to fully recover before being released back into the stream and will be released only in slow water areas. Marking, such as a small caudal fin clip, or tagging, such as PIT tagging, of hatchery and natural origin UCR spring chinook salmon juveniles would be used to determine trap efficiency and to assess juvenile seaward migration rate. Additionally, survival to adult may be determined based on PIT tag detections at dam or recoveries on spawning grounds or in broodstock. The information

gained is expected to be very valuable in increasing our understanding to UCR spring chinook salmon populations and life strategies. NMFS finds the measures above are appropriate to minimize the impacts of the proposed activities and that the information gained from the activity, which increases our understanding and ability to make good decisions concerning the implementation or management of the program, provides a benefit to the UCR spring chinook salmon ESU.

As a quantitative analysis, the WDFW juvenile fish traps are generally operated to achieve an average sample efficiency of four to 20 percent of the emigrating population from a river or stream, depending on the river size, although under some conditions traps may achieve a higher efficiency for a relatively short period of time. The mortality of captured fish would be expected to be less than two percent on target species. Using the largest of the estimates of UCR Basin natural production capacity for UCR spring chinook salmon of 753,168 (Ford et al. 2001) and assuming trap efficiency of 20 percent and mortality of two percent, an impact of 3,013 smolts would result. Converting this to adult equivalents (1.3 percent survival smolt-to-adult, (Ford et al. 2001)) results in a maximum loss of up to 39 adult UCR spring chinook salmon. Considering that juvenile fish traps will likely not be operated in all tributary basins and will not all achieve an average efficiency of 20 percent (for example, the lower Wenatchee River trap has previously achieved only about a two percent efficiency), the numeric impact will likely be much less. Based on the highest adult capacity estimate of 9,792 (Ford *et al.* 2001), or the interim abundance target of 6,250 (Lohn 2002), the loss of 39 adult spring chinook salmon would not likely substantially impact the ESU as whole. Again, it is likely that mortality from juvenile fish trapping would be much lower than this estimate.

Adult Spring Chinook Salmon

Potential research or monitoring activities of adult spring chinook salmon include in-water observation of spring chinook salmon (i.e., snorkeling). Monitoring of artificially propagated adult spring chinook salmon on the spawning grounds will be conducted by air, foot, or float surveys, and is expected to result in minimal take of UCR spring chinook salmon in the form of harassment and collection of tissues from dead spring chinook salmon. These direct observations are the least disruptive and simplest methods of determining presence/absence of the species and can be used to estimate the relative abundance. During some activities, redds may be visually inspected, but no redds would be walked on. These primarily observational activities will not result in additional mortality of UCR spring chinook salmon. The proposed observation, collection of biological data, and tissue samples from carcasses of ESA-listed fish will benefit the species as a whole, because the information gained through these activities will be used in the future to protect, recover, and manage these and other spring chinook salmon ESUs.

The three HCPs previously described require both the HCP Hatchery Committees and HCP Coordinating Committees to address issues relating to programs funded by Chelan and Douglas PUDs. A representative of NMFS is on each committee. Federal and State agencies have the additional responsibility pursuant to their agencies mandates to protect and conserve the natural resources to coordinate research actions with other co-managers that may or may not be

represented on the HCP committees. This technical and scientific scrutiny is expected to ensure that research and monitoring activities that occur in the natural environment minimize adverse impacts on ESA-listed species while maximizing the survival and recovery of anadromous fish populations. Additionally, newly initiated research projects not considered in this Opinion may need to be evaluated for potential impacts on listed species pursuant to the ESA if they include activities not previously considered.

The proposed research project to investigate the reproductive success of artificially propagated spring chinook salmon adults that spawn naturally would impact both juvenile and adult UCR spring chinook salmon. Take would occur in the form of capture, sampling, PIT tagging, and release of adult UCR spring chinook salmon at Tumwater Dam and of juvenile spring chinook salmon at various traps in the Wenatchee River Basin. These actions would occur concurrent with other activities such as broodstock collection and juvenile trapping as part of the monitoring and evaluation actions previously analyzed during the consultation on permit 1196 (NMFS 2002b). The additional tissue collection in the form of a small fin clip (0.5 cm² on adults and 0.1 cm² for juveniles) is not likely to result in any additional adverse impacts at the levels considered. Again, the potential value of the information gained through this research project will be applicable to the recovery of the Wenatchee River Basin populations, the UCR ESU as a whole, and likely many other threatened or endangered salmonid populations and ESUs.

4.2 Effects of Proposed Action on UCR Steelhead

The potential incidental effects of the amended proposed actions on UCR steelhead are evaluated in this section. Where appropriate, the applicants propose techniques to reduce incidental impacts on UCR steelhead.

4.2.1 Chelan PUD and Douglas PUD Activities

No additional or new adverse impacts on UCR steelhead are anticipated from the PUD actions of funding and implementing artificial propagation programs of UCR spring chinook salmon.

4.2.2 Extend Duration of Permit

NMFS action of extending the duration of permit 1196 from five years to ten years is not anticipated to adversely impact UCR steelhead for similar reasons as mentioned above in section 4.1.2. The three HCPs and the permit conditions clearly provide for ongoing review and adjustment of the artificial propagation programs. Furthermore, if NMFS finds that the implementation of the HCPs results in adverse impacts on UCR steelhead not previously considered during the consultation, then NMFS must reinstate consultation. NMFS finds that these mechanisms are sufficient to protect the UCR steelhead.

4.2.3 Monitoring and Evaluation

Natural environment monitoring of adult UCR spring chinook salmon includes redd and carcass surveys activities. Adult UCR spring chinook salmon spawn in August and September, while UCR steelhead spawn from January through May. This separation in spawn timing results in no impact on adult UCR steelhead from the proposed monitoring of UCR spring chinook salmon. Juvenile UCR steelhead could be present in rearing habitat. Any impacts from adult spawner surveys would be minor and transitory because juvenile fish are likely to temporarily move out of an area as a surveyor passes through, but would be expected to quickly return to the vacated habitat.

As described above in Section 4.1.2, the WDFW operated juvenile fish traps are generally operated to achieve a sample efficiency of four to 20 percent of the total brood production of the target species, depending on the river size and likely target both UCR spring chinook salmon and UCR steelhead. The take of UCR steelhead from the operation of the same traps to monitor UCR steelhead is authorized under permit 1395. If collecting data on UCR steelhead is not a specific objective of the trapping project and steelhead are simply removed from the trap and released, then, based on WDFW experience with smolt trapping in the Wenatchee River Basin, trap-related mortality should be well below one percent (Andrew Murdoch, WDFW, pers. comm.).

4.3 Cumulative Effects

Cumulative effects are defined in 50 CFR §402.02 as "those effects of future State, tribal, local or private actions, not involving Federal activities, that are reasonably certain to occur in the action area considered in this biological opinion." Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities, are not considered within the category of cumulative effects for ESA purposes because they require separate consultations pursuant to Section 7 of the ESA after which they are considered part of the environmental baseline. Future State, tribal, local, or private actions within the action area are described for NEPA purposes in the EIS (NMFS 2003) regarding the implementation of the three HCP agreements. NMFS evaluated these actions to determine whether or not they would meet the requirements of the ESA. Those actions which are most notable include Washington State TMDL (total maximum daily load) development and implementation, Washington State legislation to enhance salmon recovery through tributary enhancement programs, and recent human population trends in the action area. However, after considerable review, NMFS has determined that these actions cannot be deemed reasonably likely to occur based on its ESA implementing regulations.

The Endangered Species Consultation Handbook describes this standard as follows:

"Indicators of actions 'reasonably certain to occur' may include, but are not limited to: approval of the action by State, tribal or local agencies or governments (e.g., permits, grants); indications by State, tribal or local agencies or

governments that granting authority for the action is imminent; project sponsors' assurance the action will proceed; obligation of venture capital; or initiation of contracts. The more State, tribal or local administrative discretion remaining to be exercised before a proposed non-Federal action can proceed, the less there is a reasonable certainty the project will be authorized."

There are, of course, numerous non-Federal activities that have occurred in the action area in the past, which have contributed to both the adverse and positive effects of the environmental baseline. This step of the analysis for application of the ESA Section 7(a)(2) standards requires the consideration of what of those past activities are "reasonably certain to occur" in the future within the action area.

First of all, any of these actions that involve Federal approval, funding, or other involvement are not considered "cumulative effects" for this analysis (see ESA definition, above). This Federal involvement will trigger ESA Section 7(a)(2) consultation in the future. Once the consultation on those actions is completed the effects may be considered part of the environmental baseline, consistent with the ESA regulatory definition of "effects of the action" (50 CFR §402.02). Thus, for example, state efforts to improve water quality in compliance with the Federal Clean Water Act would not be considered because of the involvement of the EPA, until separate ESA consultations are completed. Others examples include irrigation water withdrawals involving the USFS (right-of-way permits for irrigation canals) or agricultural practices that receive Federal funding through the U.S. Department of Agriculture.

Next, actions that do not involve Federal activities must meet the "reasonably certain to occur" test for NMFS to consider their effects in this Opinion. Recognizing that this is a narrower standard than used for NEPA purposes, not all of the actions identified in the EA may be considered as "cumulative effects" for this ESA Section 7(a)(2) consultation. In reviewing the actions identified in cumulative effects analysis of the EA, after eliminating from consideration those with Federal involvement, NMFS finds that currently few, if any, of the future adverse or beneficial State, tribal or private actions qualify for consideration in this analysis as "cumulative effects."

Therefore, when evaluating the status of the listed species, including their likelihood of survival and recovery, NMFS concludes that most of the factors for the decline of these species are not eligible for consideration in determining whether the authorization of incidental take under this HCP is likely to jeopardize their continued existence. Thus, the future abundance and productivity of the listed UCR steelhead and UCR spring-run chinook salmon, against which the effects of this action are considered, are likely to be improved, although to an unknown or possibly minor extent, over those reflected by the historical trends under the environmental baseline.

4.4 Integration and Synthesis

The proposed action of issuing an amended permit 1196 jointly to the WDFW, Chelan PUD, and Douglas PUD will impact the UCR spring chinook salmon ESU. In the 2002 Biological Opinion on the issuance of permit 1196, NMFS concluded that permit issuance was not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of its designated critical habitat. Furthermore, it found that the supplementation programs covered by the permit are expected to provide a survival benefit by increasing the production of Wenatchee River and Methow River spring chinook salmon smolts. The risk of loss of genetic variability (diversity) within and between populations from swamping of natural origin fish on the spawning grounds by artificially propagated fish is increased during high return years and may need to be addressed further through program modifications and future consultations. The additional actions described in this re-initiated consultation include adding Chelan and Douglas PUDs as joint permit holders with the WDFW, extending the permit duration from five years to ten years, and monitoring and evaluation activities in the natural environment will result in the take of few UCR spring chinook salmon. Take associated with those activities is expected to be primarily in the form of capture, handle, sample, and release of both adult and juvenile fish. Juvenile monitoring could result in a maximum, but likely substantially less than, a lethal take of two percent of the UCR spring chinook salmon smolts. This translates into a maximum numeric reduction of about 39 adult spring chinook salmon for the entire ESU.

The concurrent monitoring of UCR spring chinook salmon with UCR steelhead (authorized under permit 1395) and other anadromous fish species would minimize potential adverse impacts while maximizing data collection and improving the knowledge base for these species as well.

The proposed issuance of amended permit 1196 pose minimal risk to the UCR steelhead ESU. Adult UCR spring chinook salmon and UCR steelhead return and spawn at different times of the year and therefore UCR steelhead adults are not expected to be affected by returning adult artificially propagated UCR spring chinook salmon.

Juvenile UCR steelhead could be minimally impacted by the release of artificially propagated smolts. The proposed actions include measures to minimize impacts which include releasing only migration ready spring chinook salmon. Capture, handling, and release of UCR steelhead is expected during some monitoring and evaluation activities but is already authorized under permit 1395.

The monitoring and evaluation programs are expected to provide valuable information as to the impacts, beneficial or adverse, of these artificial propagation programs. NMFS supports these programs because we believe, along with the fisheries co-managers, that due to the status of the populations in these basins, these artificial propagation program are necessary to preserve and eventually recover the listed populations.

NMFS must weigh the potential benefits with the potential adverse effects when deciding whether the contemplated actions will appreciably reduce the likelihood of the UCR spring chinook and steelhead survival and recovery – the critical determination in issuing any biological opinion.

5 CONCLUSION

NMFS' approach for determining whether the proposed actions are likely to jeopardize the continued existence of ESA-listed salmonids or destroy or adversely modify designated critical habitat is based on an analysis of the existing or potential risk of hazards posed by the actions. NMFS has considered the analysis presented above and the likelihood for survival and recovery of the UCR spring chinook salmon and steelhead ESUs under the environmental baseline in making its jeopardy determination.

After reviewing the current status of UCR spring chinook salmon and UCR steelhead, the environmental baseline for the action area, the effects of the proposed artificial propagation activities in the UCR Basin, and cumulative effects, NMFS concludes that the issuance of amended ESA section 10 permit 1196, including conditions as described above, for the activities proposed, is not likely to jeopardize the continued existence of the listed ESUs or to destroy or adversely modify their habitat.

6 INCIDENTAL TAKE STATEMENT

Section 9 and rules promulgated under subsection 4(d) of the ESA prohibit the take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is defined as “an act that may include significant habitat modification or degradation where it actually kills or injures fish by impairing breeding, spawning, rearing, migration, feeding or sheltering.” Harass is defined as “actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.” Incidental take is take of listed species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this ITS. [50 CFR §402.14(I)(3)]

An ITS specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the effect of incidental take and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

6.1 Amount or Extent of Take Anticipated

The measures described in this section are non-discretionary and must be included in the ITS issued by NMFS. These measures are in addition to those identified in the original Biological Opinion on the issuance of permit 1196 (NMFS 2002a). NMFS' proposed action of issuing a section 10(a)(1)(A) permit is designed to minimize incidental take of listed species. The proposed UCR spring chinook salmon artificial propagation activities are reasonably certain to result in incidental take of UCR steelhead because juvenile UCR steelhead are known to occur in the action area.

Incidental takes of listed UCR steelhead associated with monitoring and evaluation outside of the hatchery environment may occur depending on the monitoring activity.

1. Visual observation techniques shall be employed when possible to fulfill the investigational objective rather than more intrusive techniques.

Monitoring activities such as redd counts and snorkeling do not involve collection or physical contact with UCR steelhead. These activities may result in temporary displacement of juvenile UCR steelhead from local habitats for brief periods of time. The impacts of this type of activities are currently unquantifiable but are expected to be small.

2. If a monitoring activity such as juvenile fish trapping does not include collection of UCR steelhead as an objective authorized under a separate ESA consultation the mortality impact on UCR steelhead juveniles shall not exceed one percent of the UCR steelhead encountered in the trap.

Monitoring of juvenile spring chinook salmon released from hatchery facilities or that are progeny of hatchery origin spring chinook salmon that spawned in the natural environment using techniques such as juvenile fish traps may result in the capture, handling, and release of juvenile UCR steelhead. It is expected that such monitoring activities would be conducted to minimize potential adverse impacts on UCR steelhead and likely would include steelhead monitoring as a study objective.

6.2 Effects of the Take

In the accompanying Opinion, NMFS determined that the level of anticipated take described above is not likely to jeopardize the continued existence of the listed species.

6.3 Reasonable and Prudent Measures

Reasonable and Prudent Measures (RPMs) are non-discretionary measures to minimize take that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(o)(2) to apply. NMFS has the continuing duty to regulate the activities covered by this ITS. If NMFS fails to require the

applicants to adhere to the terms and conditions of this ITS through enforceable terms that are added to the permits or grant documents, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the WDFW, the Chelan PUD, and the Douglas PUD must report the progress of their actions and the respective impacts on the species to NMFS as specified in this ITS. NMFS believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.

In order to issue the multi-year section 10(a)(1)(A) permits for the proposed actions, NMFS believes that the following reasonable and prudent measures which are in addition to those in the original Opinion (NMFS 2002a) are necessary and appropriate to minimize the incidental take of ESA-listed species associated with the UCR spring chinook salmon artificial propagation and the monitoring and evaluation efforts:

1. NMFS shall require that the Permit Holders minimize the incidental take of ESA-listed species associated with the artificial propagation by using observational techniques whenever possible to meet monitoring and evaluation objectives.
2. NMFS shall require that WDFW minimize the incidental take of UCR steelhead associated with the UCR spring chinook salmon artificial propagation program by releasing captured steelhead unharmed.

6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the program operating entities must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions which are in addition to those in the original Opinion (NMFS 2002a) are not discretionary and are valid for the duration of the respective permits:

1. Annual reports shall be provided to the Salmon Recovery Division, NMFS, documenting the incidental take of ESA-listed species associated with the endangered UCR spring chinook salmon artificial propagation each year the permit is in effect.

7 REINITIATION OF CONSULTATION

This concludes formal consultation of the actions outlined in the applications for section 10(a)(1)(A) permits. As provided in 50 CFR §402.16, reinitiation of formal consultation is required if: (1) the amount or extent of annual take, either intentional take or incidental take, is exceeded or is expected to be exceeded; (2) new information reveals effects of the agency action that may affect listed species in a way not previously considered; (3) the action is modified in a

way that causes an effect to listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the operation that results in exceeding take must cease, and consultation must be reinitiated.

The recent increased run sizes of hatchery origin UCR spring chinook salmon might lead NMFS to reassess the potential adverse impacts on the natural spring chinook populations, such as those of swamping and genetic introgression. Prior to the 2001 return year, the UCR spring chinook returns were very low, since 2001 the adult returns have rebounded, primarily attributable to improved ocean conditions. If high returns continue, it is important to identify potential alternative uses for artificial propagated adult spring chinook in order to promote the recovery of natural selection and protect natural origin spawners from being inundated by hatchery origin fish. Potential management actions include; the removal of excess artificially propagated spring chinook salmon adults at traps and ladders in the Columbia River or at tributary locations; opening fish hatchery facility ladders for artificially propagated fish to enter voluntarily; allowing selective harvest using dip nets or traditional gear by tribes that historically fished in the UCR Basin; allowing selective harvest of artificially propagated salmon by recreational anglers. If new management actions are required, the potential impacts will need to be further evaluated under the ESA in a separate consultation process.

8 MAGNUSON-STEVENSON ACT ESSENTIAL FISH HABITAT CONSULTATION

8.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and

biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

An EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

8.2 Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*O. tshawytscha*); and coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects on these species' EFH from the proposed action is based, in part, on this information.

8.3 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in this Opinion (ection 2). The actions are the issuance of an amended scientific research/enhancement permit 1196 pursuant to section 10(a)(1)(A) of the ESA for the implementation of artificial propagation rearing listed spring chinook salmon. The proposed action area is the Upper Columbia River Basin, including all river reaches accessible to salmon in Wenatchee and Methow Rivers in Washington and is part of the EFH for chinook and coho salmon. The proposed actions may also affect EFH in the lower Columbia River and near ocean areas; however, NMFS does not believe it is possible to meaningfully measure, detect or evaluate the effects of those actions in these areas, and, consequently, NMFS will not include EFH subject to these effects in the action

area. Assessment of the impacts on these species' EFH from the above proposed action is based on this information.

8.4 Effects of the Proposed Action

Based on information provided by the action agencies, and NMFS analysis in the ESA consultation above, NMFS believes that the effects of this action on EFH are likely to be within the range of effects considered in the ESA portion of this consultation.

8.5 Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NMFS had determined that the proposed action is not likely to result in additional effects on chinook or coho salmon EFH not already considered in the original Opinion on the issuance of permit 1196 (NMFS 2002a).

8.6 Consultation Renewal

The NMFS must reinitiate EFH consultation if the proposed actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR Section 600.920(k)).

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